CBRNE DETECTION

Capability Definition

The preventative Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) Detection capability provides the ability to detect CBRNE materials at points of manufacture, transportation, and use. It is important to note that the activities and tasks described in this capability will be carried out individually for each specific agent, rather than for all agents at the same time. Therefore, when considering critical tasks and preparedness measures, each task and measure should be applied separately to each CBRNE agent. For example, in considering whether technical support (or "reachback") is available, rad/nuc "reachback" is considerably different from chemical, biological, or explosive "reachback". Preparedness in one or more of the CBRNE areas does not equate to preparedness across the entire CBRNE detection spectrum.

This capability includes the detection of CBRNE material through area monitoring, but does not include detection by their effects (i.e., signs or symptoms) on humans and animals. Such population level monitoring is addressed, respectively, in the Epidemiological Surveillance and Investigation and Animal Disease Emergency Support capabilities. The CBRNE Detection capability includes the identification and communication of CBRNE threats, but does not include actions taken to prevent an incident or respond to the consequences of a CBRNE incident, which are also addressed in other capabilities.

The CBRNE Detection capability includes technology, as well as the capacity to recognize potential CBRNE threats through equipment, education, and effective protocols. Training, communication, close coordination with key partners, including intelligence, law enforcement, public safety, public health, and international partners, and public and private sector awareness of CBRNE threats are all recognized as critical enablers for this capability. However, only CBRNE detection-specific tasks within these cross-cutting elements have been identified in the discussion of this capability.

Definitions are as follows:

- Manufacture: The illegal production of CBRNE material within the borders of the U.S. and its territories.
- Transport: The movement of CBRNE material outside, across, and within the borders of the U.S. and its territories.
- Use: The deployment, emplacement, or employment of CBRNE material within the U.S. and its territories.

Outcome

Chemical, biological, radiological, nuclear, and/or explosive (CBRNE) materials are rapidly detected and characterized at borders and ports of entry, critical locations, events, and incidents

Relationship to National Response Plan Emergency Support Function (ESF)/Annex

This capability supports the following Emergency Support Functions (ESFs) and Annex:

ESF #8: Public Health and Medical Services
ESF #13: Public Safety and Security
Terrorism Incident Law Enforcement and Investigation Annex

Preparedness Tasks and Measures/Metrics

Activity: *Develop and Maintain Plans, Procedures, Programs, and Systems*	
Critical Tasks	
Pre.A1a 1.1	Develop and maintain plans and processes for CBRNE detection and communication operations
Pre.A1a 1.1.1	Develop regional CBRNE coordination plans or activities involving all Federal, State, local, tribal, and private stakeholders
Pre.A1a 1.1.2	Develop policies and protocols for determining appropriate locations for detection operations ("interdiction points") for each CBRNE agent
Pre.A1a 1.1.3	Develop processes to identify, acquire, and integrate appropriate detection technology in operational environments for each CBRNE agent
Pre.A1a 1.1.4	Develop protocols for resolving CBRNE alarms
Pre.A1.a 1.1.5	Develop procedures on how to receive threat information from law enforcement/ intelligence agencies regarding CBRNE agents
Pre.A.1.a 1.1 6	Develop procedures on how to notify appropriate officials of CBRNE detection results
Pre.A1a 1.2	Develop standards for detection technologies for each CBRNE agent, including sensitivity and selectivity standards
Pre.A1a 1.2.1	Develop and implement global standards for cargo screening) for each CBRNE agent in coordination with Transportation Screening
Pre.A1a 1.2.2	Develop and implement equipment acquisition and certification standards for each CBRNE agent
Pre.A1a 1.2.3	Develop technology standards for existing detection technologies used by the government and private sector for each CBRNE agent
Pre.A1a 1.2.3.1	Develop technology standards for emerging detection technologies for each CBRNE agent
Pre.A1a 1.2.4	Validate analytical methods to detect chemical, biological, radiological, nuclear, and explosive material
Pre.A1a 1.3	Establish policies and agreements to enhance and maintain adequate resources and technologies for detection operations for each CBRNE agent
Pre.A1a 1.3.1	Establish coordination and/or mutual aid agreements with external CBRNE detection and alarm resolution capabilities
Pre.A1a 1.3.2	Establish protocols to ensure that technical support (either on-site or "reach back") is available during detection operations for each CBRNE agent
Pre.A1a 1.3.3	Identify financial and technological gaps in detection resources for each CBRNE agent
Pre.A1a 1.3.4	Acquire and allocate resources to address identified financial gaps in detection for each CBRNE agent
Pre.A1a 1.3.5	Establish a research and development program to address shortfalls in technologies for detecting chemical, biological, radiological, nuclear and explosive material
Pre.A1a 1.4	Establish policies and agreements to facilitate the sharing and dissemination of information on CBNRE detection across stakeholders
Pre.A1a 1.4.1	Develop processes for obtaining data regarding evolving CBRNE threats in coordination with the Information Sharing and Dissemination Capability

Pre.A1a 1.4.2	Develop procedures to facilitate the exchange of CBRNE detection-related information and data among Federal, State, local and tribal agencies
Pre.A1a 1.4.3	Establish policies and procedures for detection of each CBRNE agent and the communication of CBRNE detection results and warnings
Pre.A1a 1.4.4	Establish and maintain an interoperable information network for detection of each CBRNE agent
Pre.A1a 1.5	Develop and implement a program to conduct detection of each CBRNE agent at critical infrastructure/key resources (CI/KR) in coordination with the Critical Infrastructure Protection Capability
Pre.A1a 1.5.1	Conduct a CBRNE threat assessment to CI/KR
Pre.A1a 1.5.2	Conduct detection requirements analysis for each CBRNE agent for CI/KR
Pre.A1a 1.5.3	Identify locations to place detection devices at CI/KR for each CBRNE agent
Pre.A1a 1.5.4	Prioritize and allocate CBRNE detection resources to CI/KR in coordination with Critical Infrastructure Protection capability
Pre.A1a 1.5.5	Deploy fixed and mobile detection resources to CI/KR for each CBRNE agent

Preparedness Measures	**Metrics**
Technological shortfalls in detection for each CBRNE agent have been identified	Yes/No
A research and development program to address the detection technological shortfalls for each CBRNE agent is in place	Yes/No
A program for the timely development of standards for emerging technology is in place	Yes/No
A process to identify, acquire, and integrate appropriate technology in operational environments is in place	Yes/No
Technical support for each CBRNE agent is available (on-site or through "reach back")	Yes/No
A standard list of threats of concern for each CBRNE agent is in place	Yes/No
Appropriate levels of detection sensitivity for each CBRNE agent have been selected for the identified threats of concern	Yes/No
Detection sensitivity thresholds for each CBRNE agent comply with appropriate international, national, State, and local standards	Yes/No
A regional detection plan for each CBRNE agent has been developed and coordinated	Yes/No
Protocols have been developed and incorporated in plans to communicate CBRNE detection activities, locations, anomalies and their resolution to appropriate personnel (e.g., intelligence, law enforcement, hazardous materials (HazMat), and public health personnel)	Yes/No
Protocols for notifying officials include agency specific call-down lists	Yes/No
Frequency with which CBRNE detection plans are updated to reflect current critical infrastructure/key resources (CI/KR) assessments	Every 12 months
Appropriate procedures exist for CBRNE detection at critical infrastructure/key resources (CI/KR) for specific threat conditions	Yes/No
Integrated detection architectures for each of the CBRNE agents exist for all levels of government (Federal, State, local, tribal)	Yes/No
Gaps in detection capability for each of the CBRNE agents are identified	Yes/No

A process to acquire and allocate resources and fill CBRNE detection gaps is in place	Yes/No

Activity: *Develop and Maintain Training and Exercise Programs*	
Critical Tasks	
Pre.A1a 2.1	Develop and maintain training programs to support CBRNE detection and communication operations
Pre.A1a 2.1.1	Identify personnel for CBNRE detection training
Pre.A1a 2.1.2	Develop and implement training to enable personnel (e.g., first responders, law enforcement, intelligence, and medical community) to recognize the presence of CBRNE material
Pre.A1a 2.1.3	Establish key personnel training standards for CBRNE detection
Pre.A1a 2.1.4	Provide CBRNE support equipment and threat device handling training to operations and investigation personnel
Pre.A1a 2.1.5	Develop and implement public education campaigns/ trainings for CBRNE awareness
Pre.A1a 2.1.5.1	Publish and distribute CBRNE detection awareness material
Pre.A1a 2.2	Test and exercise CBRNE detection and communication protocols regularly
Pre.A1a 2.2.1	Conduct after action reports (AARs) and update CBRNE detection and communication protocols, as necessary, based on lessons learned during exercises

Preparedness Measures	**Metric**
First responders and CI/KR personnel have received awareness level training for each of the CBRNE agents	Yes/No
Appropriate personnel have been identified for CBRNE detection training (e.g., law enforcement, transit police and security, fire department, hazardous materials (HazMat), public health, private sector security, and critical infrastructure personnel)	Yes/No
Frequency with which detection protocols for each of the CBRNE agents are exercised and evaluated	Every 12 months
Training for detection operators, laboratory staff, and critical infrastructure personnel has been conducted	Yes/No
A program to test and evaluate new CBRNE technology in the appropriate operational environment is in place	Yes/No
Detection training materials have been developed and validated for each CBRNE agent	Yes/No
Percent of required personnel trained to meet jurisdictional CBRNE detection requirements	100%
Public education campaigns exist for CBRNE detection	Yes/No
The CBRNE detection exercise program is in compliance with Homeland Security Exercise and Evaluation Program (HSEEP) guidance	Yes/No
Frequency with which CBRNE detection notification plan is exercised	Every 3 months
A process for analyzing exercise results and incorporating lessons learned is in place	Yes/ No

Performance Tasks and Measures/Metrics

Activity: *Detect CBRNE* **Definition: Operate primary and secondary CBRNE detection technologies at points of illegal manufacture, transportation, or use within and across the borders of the U.S. and its Territories**	
Critical Tasks	
Pre.A1a 3.1	Conduct CBRNE detection operations in communities for illegal manufacture and/or use
Pre.A1a 3.1.1	Investigate a venue for the possible placement of a CBRNE device
Pre.A1a 3.1.2	Detect the use of CBRNE material in a community and/or venue
Pre.A1a 3.1.3	Conduct continuous and ad hoc CBRNE material detection in a community and/or venue
Pre.A1a 3.1.4	Detect illegal manufacturing of CBRNE material at potential manufacturing sites
Pre.A1a 3.2	Conduct CBRNE detection operations at key transportation points
Pre.A1a 3.2.1	Detect CBRNE material on people or items entering/boarding events, aircraft, mass transit, or other high impact targets
Pre.A1a 3.2.2	Inspect and monitor cargo at key interdiction points for potential CBRNE material
Pre.A1a 3.2.3	Identify potential CBRNE material at key interdiction points requiring further inspection
Pre.A1a 3.2.4	Detect the ground, air, and sea transport and/or deployment of CBRNE material into and within the U.S. and its Territories
Pre.A1a 3.2.5	Screen people to detect CBRNE material at all ports of entry
Pre.A1a 3.2.5.1	Screen material (e.g., baggage, mail, etc.) to detect CBRNE material at all ports of entry (e.g., sea and airports, border crossing points, etc.)
Pre.A1a 3.2.6	Provide point and stand-off detection resources
Pre.A1a 3.3	Conduct CBRNE detection operations at CI/KR locations
Pre.A1a 3.3.1	Screen people to detect CBRNE material at all CI/KR locations
Pre.A1a 3.3.2	Screen material (e.g., baggage, mail, etc.) to detect CBRNE material at all CI/KR
Pre.A1a 3.4	Use intelligence information to focus CBRNE material searches and surveillance activities
Pre.A1a 3.4.1	Use intelligence information to target suspect containers or shipments
Pre.A1a 3.4.2	Detect the theft or diversion of CBRNE materials
Pre.A1a 3.4.3	Coordinate with Animal Health and Epidemiological Surveillance to focus CBRNE detection on public health and medical information (e.g., syndromic surveillance and medical diagnostic tests)
Pre.A1a 3.5	Implement protocols for resolving CBRNE alarms and the detection of suspect material
Pre.A1a 3.5.1	Document and maintain results from detection alarms and responses

Performance Measures	**Metrics**
Illicit chemical, biological, radiological, or explosive material are detected at borders, inspection points, or during routine law enforcement investigations	Yes/No
Surveillance systems provide early detection of a chemical, biological, or radiological release that would facilitate limiting the spread and effect of that release	Yes/No

Checked baggage and cargo entering/boarding events, aircraft, mass transit, or other potential targets are screened for CBRNE materials	Yes/No
Passengers and event attendees entering/boarding events, aircraft, mass transit, or other potential targets are screened for CBRNE materials	Yes/No
CBRNE detection efforts are informed by intelligence, public safety, and public health information	Yes/No
Venues are inspected for potential CBRNE threats prior to major events	Yes/No
Ad hoc CBRNE surveillance capabilities are deployed in response to potential threats	Yes/No
Accurate records are kept of all suspect issues or alarms and their resolution	Yes/No

Activity: *Identify and/or Characterize CBRNE material*

Definition: Describe or portray the qualities of detected CBRNE material

Critical Tasks	
Pre.A1a 4.1	Conduct additional screenings to confirm the presence of CBRNE materials
Pre.A1a 4.1.1	Provide samples to relevant entities (e.g., public health or animal health laboratories, law enforcement, forensic laboratories, etc.) for additional assessments, as necessary
Pre.A1a 4.1.2	Conduct appropriate tests and assessments to characterize and identify detected CBRNE material
Pre.A1a 4.2	Determine whether detected CBRNE material is a threat
Pre.A1a 4.3	Gather CBRNE material detection information that can be used in attribution efforts to appropriate personnel, including law enforcement and intelligence community personnel

Performance Measures	Metrics
Suspicious material is analyzed (either on-site or via laboratory support)	Yes/No
Percent of CBRNE alarms, or suspect material discoveries, at interdiction points that are resolved	100%
Percent of CBRNE materials that are correctly identified as either a threat or not a threat	100%
Percent of detected CBRNE materials that are properly identified	100%

Activity: *Communicate CBRNE Detection Incidents*

Definition: Provide CBRNE detection and warning information to appropriate entities and authorities

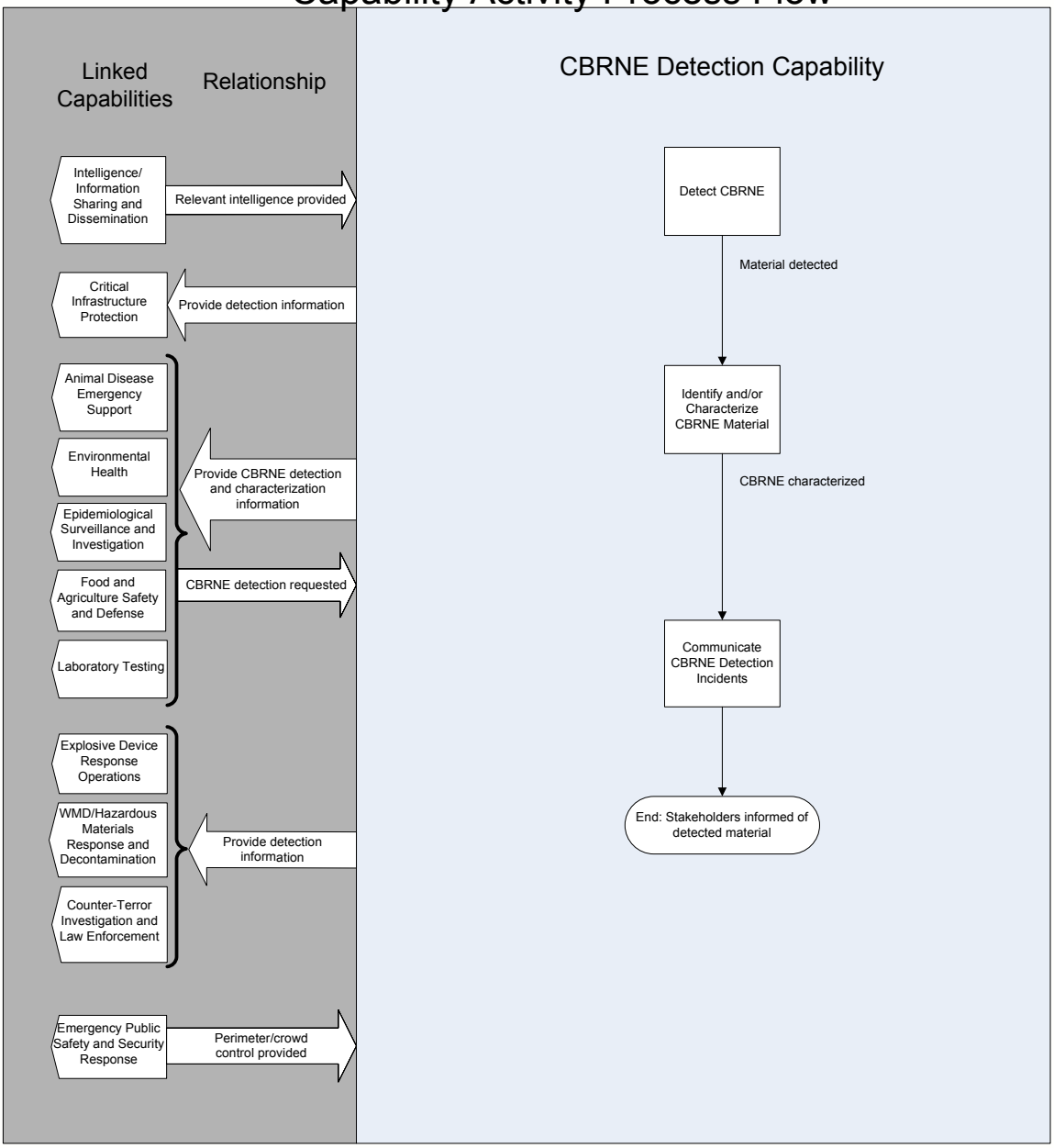
Critical Tasks	
Pre.A1a 5.1	Coordinate CBRNE material threat and discovery information with intelligence, public safety, public health and other appropriate agencies
Pre.A1a 5.2	Notify appropriate personnel (e.g., intelligence community, law enforcement personnel, first responders, and the general public) of CBRNE detection data and results
Pre.A1a 5.3	Communicate data and observations using appropriate formats and standards

Performance Measures	Metrics
Disseminated information in event of CBRNE detection follows established protocol	Yes/No
CBRNE detection notification is completed in accordance with relevant plans and protocols	Yes/No

Linked Capabilities

Linked Capability	Relationship to Capability
Critical Infrastructure Protection	CBRNE Detection provides Critical Infrastructure Protection with detection and characterization information.
Environmental Health	CBRNE Detection provides material characterization to Environmental Health. Environmental Health data may signal the need for CBRNE detection.
Explosive Device Response Operations	CBRNE Detection provides material characterization to Explosive Device Response Operations.
Intelligence and Information Sharing and Dissemination	Intelligence/ Information Sharing and Dissemination provides CBRNE Detection with all relevant intelligence.
Counter-Terror Investigation and Law Enforcement	Detection of CBRNE materials may trigger the need for a law enforcement investigation, and may affect how law enforcement operations are conducted
Laboratory Testing	Laboratory Testing results may indicate potential CBRNE threats. CBRNE Detection may receive assistance in characterizing the detected material from Laboratory Testing.
Emergency Public Safety and Security Response	CBRNE Detection may require Emergency Public Safety and Security Response for perimeter and crowd control.
WMD and Hazardous Materials Response and Decontamination	CBRNE Detection informs WMD and Hazardous Materials Response and Decontamination of CBRNE materials.

Capability Activity Process Flow



Resource Element Description

Resource Elements	Components and Description
CBRNE Detection operator/ personnel	Specially trained and equipped personnel with the ability to recognize potential Chemical, Biological, Radiological, Nuclear, or Explosive threats through equipment, education, and effective protocols. Personnel must be trained and capable of operating primary and secondary detection systems.
Explosive Detection Dog (EDD) Teams	A canine and handler, working as a team to perform explosive detection searches of building and office areas, vehicles, packages, materials and persons
Laboratory staff and equipment for agent identification	Personnel specially trained and equipped to analyze suspicious materials in support of characterization and confirmation. This may involve laboratory networks (e.g., Laboratory Response Network (LRN), FERN, Animal and Plant Health Inspection Service (APHIS), and National Animal Health Laboratory Network (NAHLN))
Border control and other targeted 'defense layers' personnel	Personnel involved in screening materials (e.g., baggage, mail, etc.) to detect CBRNE material at all ports of entry (e.g., sea and airports, border crossing points, etc.)
Appropriate critical infrastructure personnel	Critical infrastructure personnel who are trained in CBRNE screening and detection of CBRNE materials
Automated Information System	Resources that provide the infrastructure for the dissemination of information amongst the various command/control and support nodes
CBRNE detection Research and Design	Programs for the development of technologies to improve CBRNE detection
CBRNE monitoring and detection equipment	Appropriate fixed or mobile equipment for detection of CBRNE threats based on risk assessments for priority communities or venues.
CBRNE equipment support systems	Systems to ensure that equipment remains operational and accurate. Systems to provide expert analytical assessments of detector data

Planning Assumptions

- Although applicable to several of the 15 National Planning Scenarios, capability planning factors were developed from an in-depth analysis of the scenarios featuring an improvised explosives device, a chlorine tank explosion, aerosol anthrax, an improvised nuclear device, and a radiological dispersal. Other scenarios were reviewed to identify required adjustments or additions to the planning factors and national targets.
- CBRNE detection activities apply to the U.S. and its territories.
- The CBRNE Detection capability addresses biological agents outside of the body (human and animal), and does not include medical or plant samples (i.e., blood and medical tests). Medical and syndromic surveillance detection of biological agents is addressed in Epidemiological Surveillance and Investigation, as well as Food and Agriculture Safety. Close integration of these capabilities must occur with the CBRNE Detection capability.
- Both the Planning Factors from an In-Depth Analysis of a Scenario with Significant Demand for the Capability section and the Approaches to Large-Scale Events section have been omitted because there is no incident or large-scale event that necessarily occurs before these capabilities come in to play.

- Intelligence/information fusion is an ongoing, cyclical process that incorporates three primary capabilities: Information Gathering and Recognition of Indicators and Warnings; Intelligence Analysis and Production; and Intelligence and Information Sharing and Dissemination. The CBRNE Detection capability relates closely to all three stages of this process.
- All appropriate objectives and critical tasks will be exercised regularly at all levels in order to measure performance and demonstrate capability.
- Planning factors are not based on major events, but on an assessment of the risks and vulnerabilities that pertain to the locality conducting that assessment. CBRNE detection is needed continuously and not just during discrete events.

Resource Element	Estimated Capacity	Scenario Requirement Values	Quantity of Resources Needed
CBRNE detection/operating personnel	Nationwide, organized regionally		Nationwide, organized regionally
Automated Information System	One integrated system will provide the infrastructure for dissemination of information amongst the various command/control and support nodes.		Nationwide, nested regionally
Automated Information System	One integrated system will provide the infrastructure for dissemination of information amongst the various command/control and support nodes.		Nationwide, nested regionally
CBRNE equipment support systems			Nationwide, organized regionally

Approaches for Large-Scale Events

- The main strategy is to use detection technologies and screening processes to interdict the CBRNE materials before they are used. The alternative is to rely on existing detection technology; law enforcement investigations and alternate technologies will determine the presence of threat devices.
- Develop the national capability through design and deployment of the Global Nuclear Detection Architecture and other similar programs.
- Encourage states and local jurisdiction to develop and implement detection capabilities through use of DHS grants and guidance.
- Develop equipment, training and communications standards to facilitate and validate the deployment and use of detection technologies.

Target Capability Preparedness Level

Resource Element Unit	Type of Element	Number of Units	Unit Measure (number per x)	Lead	Capability Activity supported by Element
CBRNE detection operator/ personnel	Personnel	Varies by Region	Varies by Region	Federal/State/ Local	All Activities

Resource Element Unit	Type of Element	Number of Units	Unit Measure (number per x)	Lead	Capability Activity supported by Element
Explosive Detection Dog (EDD) Teams	Personnel and Canine	Varies by Region	Varies by Region	Federal	Detect Identify and/or Characterize
Laboratory staff and equipment for agent identification	Personnel and Equipment	Varies by Region	Varies by Region	Federal/State Local	Identify and/or Characterize
Border control and other targeted 'defense layers' personnel	Personnel	Varies by Region	Varies by Region	Federal/State	Detect
Appropriate critical infrastructure personnel	Personnel	Varies by Region	Varies by Region	Private Sector	Detect
Automated information system	Equipment	Varies by Region	Varies by Region	Federal/State/ Local	Communicate
CBRNE detection technology Research and Development	Organization and Leadership	Varies by Region	Varies by Region	Federal	All Activities
CBRNE monitoring and detection equipment	Equipment	Varies by Region	Varies by Region	Federal/State/ Local	Detect Identify and/or Characterize
CBRNE Equipment Support Systems	Equipment	Varies by Region	Varies by Region	Federal/State/ Local	Detect Identify and/or Characterize

References

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